

cial functions the conduct of an economic survey of the natural resources of South Africa, the extension of provision for industrial research, co-ordination of industrial investigation, the elimination of overlapping in such work, and the provision of means for taking advantage of facilities for investigation not available in South Africa by co-operation with similar organisations in the United Kingdom and the other British dominions. The committee has so far made two chief recommendations, viz. (1) the appointment of various authorities in South Africa to report on the natural resources of the country, and (2) the publication of an industrial journal to give publicity to the reports and data collected under the committee's auspices. The first of these recommendations is being carried out, and the second has been given effect to in the issue of the *South African Journal of Industries*.

In common with most of the overseas British dominions South Africa, largely as a result of the war, is in the throes of new industrial developments with the view of providing the necessities it formerly imported, but which it can no longer procure from the manufacturing countries in Europe. The first number of the journal is naturally largely occupied with articles surveying the present situation. Among these may be mentioned Mr. Warrington Smyth's article on "The Beginnings of Organisation for Industrial Expansion"; that on the "Census of Manufacturing Industries, 1917," by Mr. C. W. Cousins, Acting Director of the Census; and Dr. Lehfeldt's report on "The Economics of Agricultural Production in South Africa." Among the new South African industries to which attention is directed is the manufacture of industrial alcohol, for use as a motor fuel, from the molasses produced on sugar estates in Natal. A report by the Imperial Institute on the results of examination of the fruits of *Ximenia americana* is printed, and Dr. Philips contributes a useful *résumé* of the information available regarding "buchu," a drug the production of which is a monopoly of South Africa.

The article in *NATURE* already mentioned directs attention to the difficulties of co-ordinating industrial research in the United Kingdom, and shows that there is no evidence that such co-ordination has yet been effected or is in process of being arranged. The appearance of the *South African Journal of Industries* is a reminder of the existence of the larger and still more difficult problem of devising means for the utilisation of the resources of the Empire within the Empire itself, and the solution of which is of first-rate importance to both British and Colonial industries.

NOTES.

AMONG the promotions in and appointments to the Most Excellent Order of the British Empire for services in connection with the war announced on Tuesday, we notice the following:—*Knights Commanders (K.B.E.)*: Mr. James Cantlie, member of Council and of Executive Committee, British Red Cross Society; Col. C. F. Close, Director-General of the Ordnance Survey of the United Kingdom; Dr. W.

Morley Fletcher, secretary of the Medical Research Committee; Dr. J. Galloway, Chief Commissioner for Medical Services, Ministry of National Service; Dr. R. Robertson, superintending chemist, Research Department, Woolwich Arsenal; Prof. W. H. Thompson, scientific adviser to the Ministry of Food. *Commanders (C.B.E.)*: Prof. F. J. Cheshire, adviser on scientific side of Optical Munitions Branch, Ministry of Munitions; Dr. G. H. Fowler, Hydrographic Department, Admiralty; Prof. W. R. Hodgkinson, professor of chemistry and metallurgy, Ordnance College, Woolwich; Mr. R. G. K. Lempiert, Superintendent of the Forecast Division, Meteorological Office; Prof. W. J. Pope, professor of chemistry, University of Cambridge, member of panel of Board of Invention and Research, Admiralty; Prof. T. B. Wood, Drapers professor of agriculture in the University of Cambridge, adviser on meat production to the President of the Board of Agriculture, and chief executive officer, Army Cattle Purchase Scheme; Mr. G. Udy Yule, Director of Requirements, Ministry of Food. In addition, about two thousand names are included in lists of new officers and members of the Order (O.B.E. and M.B.E.).—Prof. James Ritchie, Irvine professor of bacteriology, University of Edinburgh, asks us to correct the mistake made in last week's issue of *NATURE* announcing that a baronetcy had been conferred upon him. The recipient of the distinction was not Prof. Ritchie, but Sir James W. Ritchie, son of a former Lord Mayor of London. We regret the error, but the Press announcement that it was Prof. Ritchie who had received the honour was perhaps a natural one for a scientific journal to accept.

Is the Carnegie Trust for the Universities of Scotland doing its duty in strengthening and developing scientific study and research? That is the question suggested by the report of a special committee published in the December number of the *Journal of the British Science Guild*. The question was first raised in an incisive manner by Prof. Soddy in an article communicated to *Science Progress* (January, 1917), and further inquiry seems to show that his contention is well founded. There may be some difference of opinion as to the exact interpretation of Clause A of the Trust Constitution; but there can be no doubt that the main object of the trust is to foster science, pure and applied, in all its branches, and to strengthen that side of university education which is of direct technical or commercial value. In the light of that general principle the following facts are well worthy of careful consideration:—(1) Only 14 per cent. of the available funds have been expended on scientific research; (2) by endowment out of Carnegie Funds of certain scientific departments, money formerly spent in their maintenance has been diverted into other channels, so that the university on its scientific side has not really been strengthened; (3) among the twenty-two members of the Board of Trustees, there have never been more, and have usually been fewer, than four who could be regarded as representing science, the majority being practically ignorant of the methods, and even the meaning, of research.

STEPS are being taken to incorporate the Selborne Society and to widen its objects, so that it may not in any way be hampered in its efforts to bring home to the public, especially through its lecturers, the great value of science to the community.

THE death is announced, on January 5, in his sixty-seventh year, of Mr. R. C. Woodcock, fellow of the Institute of Chemistry and of the Chemical Society, and author of a number of papers upon analytical chemistry.

THE death is announced, in his seventy-sixth year, of Dr. W. L. Purves, consulting aural surgeon, Guy's Hospital, consulting ophthalmic and aural surgeon, Hospital for Diseases of the Nervous System, and aural surgeon to the Royal Normal College and Academy of Music for the Blind.

At the scientific meeting of the Royal Dublin Society held on December 19 last, Lord Rathdonnell, president, in the chair, the Boyle medal of the society was presented to Prof. J. A. McClelland, F.R.S., in recognition of his distinguished work in many branches of science, especially with those dealing with ionisation, and the more recently discovered forms of radiation associated pre-eminently with radio-activity.

THE death occurred on December 30, at the age of sixty-four years, of Sir William H. Lindley. To those who knew of the service Sir William rendered to the Royal Commission on Canals and Inland Navigation by the compilation of an exhaustive report on the waterways of France, Belgium, Germany, and Holland, published in vol. vi. of the Commission Bluebooks, the announcement of the knighthood, conferred upon him in 1911, came as no surprise. But to the general public his reputation was not so familiar, and this is scarcely surprising, seeing that the sphere of his professional activities lay almost entirely on the Continent, particularly in Germany and Austria-Hungary, where he succeeded to his father's position and influence. Sir William began his career in 1870, as resident engineer on the Budapest waterworks, and, three years later, took up the post of engineer to the city of Frankfort-on-Main, where, for more than twenty years, he administered the works of the municipality and port. During his lifetime he had associations with the towns of Elberfeld, Homburg, Mannheim, Würzburg, Cracow, Prague, Warsaw, Bukharest, and Baku, in connection with various electricity, waterworks, and sewerage undertakings. But for certain adverse circumstances Petrograd would have been added to the list, for, as recently as 1912, he was appointed engineer-in-chief of a new municipal water-supply and drainage scheme for the Russian capital; the project, however, did not mature. His reputation among German engineers was deservedly high, and he discharged presidential functions on several Commissions. He had been a member of the Institution of Civil Engineers since 1878.

THE following minute, adopted by the board of trustees of the New York Memorial Hospital, is published in *Science*:—Dr. Richard Weil, Major in the Medical Reserve Corps, U.S.A., died while on active duty at Camp Wheeler, Macon, Ga., November 19, 1917. By his death the Memorial Hospital loses one of the most highly trained and successful workers of its medical staff, and American cancer research one of its recognised leaders. Since 1906 Dr. Weil had been an active member of the staff of the Huntington Fund, and throughout this period of eleven years he was constantly engaged in the problems of cancer research. His contributions in the field of the serology of cancer and in the general problems of immunity gained for him an international reputation. He was one of the founders of the American Association for Cancer Research, and largely through his efforts was founded the *Journal of Cancer Research*, of which he was editor-in-chief. At the reorganisation of the Memorial Hospital in 1913, Dr. Weil assumed the position of assistant director of cancer research and attending physician to the hospital, and in this capacity he laboured energetically to establish an efficient organisation of the routine and research work of the hospital. In 1915 he resigned the position of assistant director upon his appointment as professor of experimental medicine in Cornell Univer-

sity, but he continued without interruption his experimental work in cancer. Upon the declaration of war he was among the first to offer his services to the Government, and spent the summer at Fort Benjamin Harrison in the Medical Officers Training Corps. Quite recently he was detailed to take charge of a large military hospital at Camp Wheeler, Macon, Ga., and here in the performance of strenuous military service he fell a victim to pneumonia. During his brief but brilliant career he attained eminence as a devoted laboratory worker, a skilful experimenter, a highly trained clinician, and a forceful writer, while his untimely death places his name among the first on his country's honour roll in the great war.

A REPORT containing the results of Dr. Benjamin Moore's researches on "The Causation and Prevention of Trinitrotoluene Poisoning" has just been issued by the Medical Research Committee (Special Report Series No. 11). It is shown that the only important avenue of entrance into the body is through the skin. The amount taken in as vapour or as dust is innocuous. The first noticeable indications of poisoning are those due to deficient oxygen supply, especially blueness of the skin and lips. This results from the action of the poison in decreasing the capacity of hæmoglobin to take up oxygen, a well-known effect on the respiratory process produced by nitro- and amino-benzene derivatives in general. Trinitrotoluene is said to convert hæmoglobin into its NO derivative, together with met-hæmoglobin. Various results follow from the deficiency of oxygen supply to the organs, but whether the degeneration of the liver and the consequent jaundice are secondary, as Dr. Moore holds, or whether the poison acts directly on the liver cells, is at present a matter of dispute. The same may be said for the anæmia. But the practical point is that the cyanosis is the sign to be looked for. Individuals differ in the property of their skins to absorb the poison, and it is recommended that all those showing susceptibility should be rigorously excluded from the work. A further preventive is covering the arms and hands with a casein varnish. Gloves are useless. The poison is reduced in the body, probably by the liver, to the hydroxylamino-derivative, and eliminated in the urine, conjugated with glucuronic acid. It is important, therefore, that the diet should include substances which afford a supply of this acid, namely, fresh vegetables and fruit.

Engineering, in its leading article for January 4, deals with standard aero-engine production, which in this country is in a state of chaos. More than forty different types of aero-engines are now being manufactured in Britain, and about as many firms are engaged in their manufacture. The labour absorbed in the extravagant multiplication of tools, jigs, gauges, drawings, and patterns, regrettable though it is, does not end the burden on the Air Service through this variety of designs. The effect, for instance, on the stocks of spares may easily be imagined; the engines are so different in construction that aerodromes at the front not only require separate spares for the several types that are used there, but also have to keep, for purposes of overhaul, separate gangs of mechanics versed in their individual peculiarities. The Production Department that now serves the Air Council in the Ministry of Munitions is well placed for obtaining improvement in the rate of manufacture, but the particulars that have been published of its constitution do not satisfy engineers that it is in a position to use its advantage. So far as is known, the department does not include men on its staff who would be accepted by engineers generally as able to speak with the necessary first-hand knowledge and authority on either the design of internal-combustion engines or the methods

of intensive manufacture. While the Production Department lacks specialised knowledge and authority, even the great abilities of the Director-General will be insufficient to produce the desired results. The duty of manufacturing engineers is to produce the engines, and while the machinery for controlling manufacture remains as it appears to be, it is preventing them from discharging that duty.

FROM the point of view of a statistician and avowedly in the spirit of an iconoclast, Mr. F. J. Brodie considers, in the December issue of *Symons's Meteorological Magazine*, the evidence in respect of the theory as to connection between gunfire and rainfall that can be gathered from the published figures in the weather reports of the Meteorological Office for the three years of the war ended September, 1917. From a series of maps showing the quarterly variation of rainfall with respect to the average for each of the twelve districts into which the British Isles are divided for meteorological purposes, the following conclusions are reached:—(a) That over a large portion of the United Kingdom an excess of rain was reported in nine quarters out of twelve; (b) that in seven out of the nine wet quarters the excess of rain was greatest in districts situated in the eastern or southern half of the country; further, that in two of the three dry quarters the only districts which failed to report any deficiency were again situated either in the eastern or in the southern section. For the whole period the excess was as much as 26 per cent. in England S.E., 20 in England E., 14 in the Midlands, 10 in England N.E., and 9 in England S.W.; while in Scotland N. and W. there were deficiencies of 5 and 10 per cent. respectively—a suggestive enough distribution. Unfortunately, the figures for northern France and Belgium are not available—the more so since M. Angot, writing in May, 1917, observed that no distribution of excessive rainfall having reference to a centre in the war area had been found in France. It is also worthy of remark that there was, prior to the outbreak of war, every reason for anticipating a continuance of the spell of wet years that had set in, in compensation for the long dry period that marked the nineties of last century and the opening decade of the present century (in London, 1903 was the only wet year between 1894 and 1909); furthermore, that one of the three dry quarters was that of July–September, 1916—the period of a great offensive in Flanders—and that the spring offensive of 1917 also was favoured with fine weather. So long is the arm of coincidence and so infinite are the resources of our climate that, in the absence of valid physical proof, it is doubtful whether, even in the event of similar conditions continuing for another three years (or the duration of the war), meteorologists would be convinced that the “frightfulness” of man can influence the course of the elements.

THE Société d'Anthropologie de Paris bravely continues its work in spite of the war. In part ii. of the *Bulletins et Mémoires* for 1916, which has just reached us, M. R. Anthony contributes a graceful obituary of one of its most illustrious foreign associates, Sir W. Turner. This is accompanied by a full catalogue, extending to nine pages octavo, of the works and papers on anatomy, physiology, and anthropology contributed by him.

MISS M. A. MURRAY supplements her paper in *Folklore* (vol. xxviii., No. 3, September, 1917) by an article in the *Journal of the Manchester Egyptian and Oriental Society* for 1916–17 on “The God of the Witches.” She discusses the theory of an Eastern origin of the witchcraft observances, but the evidence is not quite satisfactory. Converts from Islam to the witch cult

renounced their old religion, as did the converts from Christianity; Arab witches, like curs, used to ride about on sticks; the name of the great assemblies of the witches, Sabbath, suggests an Eastern origin, but cannot be connected with the sacred day of the Jews. “It seems certain then that in this religion, as in others, there was interchange between the East and the West. But having regard to the antiquity of the witch cult in Europe, it seems to me that the balance of evidence is in favour of its originating in the West, and being carried thence to the East.”

IN the *South African Journal of Science* (vol. xiii., No. 11, July, 1917) the Rev. Noel Roberts describes a series of Bushman rock paintings discovered at the Zoutpansberg range, in the northern Transvaal, during the construction of the railway to Messina. The ochre used is believed to be derived from a deposit in the neighbourhood of the caves, and natives assert that the white paint was obtained from the milky kernel of the *Stamvruchte* (*Chrysophyllum magalismontanum*). Much controversy has arisen regarding the meaning and purpose of the paintings. Some believe that they represent historical incidents, or depict occurrences in hunting. Others trace a connection with the art of northern Africa. But Stow's conclusion that they are purely historical still holds the field. At the same time, as Sir James Frazer has advocated, there may be a magical object, and Mr. Roberts advances some arguments in support of this view. The excavation of the detritus of the caves containing the paintings should bring to light some objects which would help to fix the date and intention of these representations. Meanwhile, the article provides a series of photographs of considerable interest.

MR. C. W. MALLY describes, in the *South African Journal of Science* (vol. xiii., No. 11, July, 1917), a method of destroying that noxious pest, the Argentine ant. The plan is to surround the opening of the nest with a cordon of finely powdered corrosive sublimate about half an inch wide. Under some conditions the ants become excited before they actually touch the powder, the result being probably due to the fact that fine particles of the sublimate are floating in the air. When the drug has been sprinkled on the soil at any point, it remains sufficiently virulent to affect the ants for a long time; some spots thus treated after eight or nine months still react on the ants when they wander over them. Heavy rain disperses the sublimate, but light rain simply carries it into the soil, and then, as the moisture evaporates, there is a tendency for the corrosive sublimate to be re-deposited on the surface. This suggests that the foundations of buildings may be treated, either during or after construction, with a solution which will protect them from ant invasion.

MR. H. H. HAYDEN, Director of the Geological Survey of India, in his report on the earthquake which occurred at Dharmasala on May 10 last, states that the situation of the station, in an area of pronounced tectonic disturbance, renders the occurrence of periodical earth shocks probable. With this possibility in view there are, Mr. Hayden suggests, the alternatives to be considered: either to abandon Dharmasala altogether, or to adopt precautions which may render earthquakes in future, so far as possible, innocuous. The first course he does not recommend, and he believes that precautions such as have been adopted in other parts of the world may render the retention of Dharmasala as a station a matter of comparatively slight risk. He advocates the erection of a new type of building, the houses being either of wood or of reinforced concrete, and he thinks that it would not be difficult to select methods of construction which

would render Dharmasala safe against any earthquake that is likely to occur.

THE problem of mining thin coal-seams has recently been the subject of considerable discussion in Great Britain, and it is interesting to note that it has at the same time been attracting attention in Canada, as is shown by a recent publication of the Canadian Department of Mines, Bulletin No. 15, on the mining of thin coal-seams as applied to the eastern coalfields of Canada, written by Mr. J. F. Kellock Brown. The author discusses the technical aspects of the question, but lays most stress upon its economics. He points out that the present coal industry of eastern Canada is in a weak position, having reached its period of best productivity, but beset with outside competition and rising costs, and operated by over-capitalised concerns, the earning capacity of which is only 3 or 4 per cent. of their capital. He estimates that the coals now being worked may well be exhausted in about a century, and therefore proposes that the industry should be reorganised, worked by powerful corporations or combinations, and that legislation should compel the working of a certain proportion of coal from the thin seams along with that of the more easily wrought thicker seams. He considers that "when properly operated, and properly financed under reasonably favourable conditions, 12-in. seams of coal can be worked economically in eastern Canada to-day," though it is doubtful whether many colliery engineers in this country would fully concur in this conclusion. In any event, the bulletin is an important contribution to the great problem of the proper and effective utilisation of the mineral resources of the British Empire, and deserves careful study from this point of view, as well as for the technical considerations involved. Under the latter head numerous details of machine mining and underground conveyer systems are given, together with the actual operating costs in a few selected examples. The author appears to have reached the definite conclusion that in mining thin seams machine work—not only machine mining, but "the application of power to the whole operation of getting the coal, from the commencement of the undercutting to the placing of the coal into the mine cars"—is essential to success.

PART 3 of vol. vi. of the Science Reports of the University of Sendai, Japan, contains the sixth, seventh, eighth, and ninth reports of the Alloys Research Institute of Japan, which all have reference to the magnetic or other properties of iron and its alloys. The eighth report, by Prof. Honda, deals with the magnetisation of iron powders as the simplest form of the problem presented by the magnetisation of alloys. The powders used were of reduced iron mixed with fine sand to obtain small amounts of iron per c.c., and compressed to get densities approaching that of solid iron. Rods of 0.5 cm. diameter 15 cm. long were magnetised in a coil, providing fields up to 1000, and the magnetisation measured ballistically. The curve showing the relation between the specific magnetisation (the quotient of the intensity of magnetisation by the mass of iron per c.c. of the specimen) of the solid iron is of the usual type, the bend or shoulder occurring between fields 50 and 200, and the saturation value of the specific magnetisation being 210. For a powder containing three-fourths the iron per c.c. the curve shows no shoulder, though it is convex upwards. At a field of 1000 its specific magnetisation is only 140, and shows no sign of saturation. For smaller quantities of iron per c.c. the curves become nearly straight lines—that is, the specific magnetic susceptibility becomes constant for each mixture, but decreases as the mixture contains less iron.

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THE latest list of Mr. F. Edwards, 83 High Street, Marylebone, W.1 (No. 380), contains 1066 items, and is devoted to biography. It is not very strong in science, but among the books offered for sale we notice the memoir of "Sir Samuel Baker," by T. Douglas Murray and A. Silva White; "Sir Joseph Banks's Journal during Capt. Cook's First Voyage," edited by Sir J. D. Hooker; "Life of Sir Joseph Banks," by E. Smith; the first edition of Washington Irving's "Christopher Columbus: History of his Life and Voyages"; "Charles Darwin: Life and Letters," edited by Sir F. Darwin; "Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton," by Sir D. Brewster, and several lives of men of science which have been published during the past few weeks. The catalogue will be sent upon written application.

MR. W. HEINEMANN will shortly publish vol. ii. of Dr. Montessori's "The Advanced Method." The work will deal with the Montessori material, and the use of it, for children up to the age of eleven years, and will be illustrated. It is announced in connection with the volume that an authorised Montessori Training Institute is to be established in this country, presided over by Dr. Montessori.

OUR ASTRONOMICAL COLUMN.

ENCKE'S COMET.—Encke's comet, which has been observed at every perihelion passage since 1819, has once more been detected, the discoverer being Prof. Schorr, at Bergedorf, Hamburg. The position on December 30 at 5h. 27m. G.M.T. was R.A. 22h. 59m. 4.93s., N. declination $3^{\circ} 17' 35''$. The comet was of the 15th magnitude, but should brighten considerably in the next few weeks. The observed R.A. was smaller than the tabular by 4s., the declination smaller by 40". These small residuals indicate that Mr. Viljev's calculated time of perihelion passage 1918 March 24.3 G.M.T. is not much in error, perhaps about 0.2d. too late. This adds certainty to Mr. Viljev's conclusion that the object observed in September and November, 1916, was not the comet. An ephemeris was given in NATURE of December 27.

THE NEAREST STAR KNOWN.—In Circular No. 40 of the Union Observatory, Mr. Innes gives the results of observations made for the determination of the parallax of the interesting faint star near α Centauri to which he first directed attention about two years ago. The observations extended from May 26, 1916, to August 23, 1917, and were made with a micrometer attached to the 9-in. equatorial at Johannesburg. The resulting value for the parallax is 0.88", as compared with 0.755" recently determined at the Cape Observatory by Mr. Voûte. The mean of the two values is 0.82". The largest parallax previously known is that of α Centauri, which Kapteyn gives as 0.759", and it would thus appear that the Innes star is the nearest known star to the solar system. The proper motion of the faint star is closely similar, in both magnitude and direction, to that of α Centauri, notwithstanding the separation of $2^{\circ} 13'$. Mr. Innes suggests *Proxima Centaurus* as a convenient name for this small star. The visual and photographic magnitudes of the star are 11 and 13 respectively.

THE INTERIOR OF A STAR.—An interesting popular account of his mathematical investigations relating to the physical conditions in the interior of a star is given under this title by Prof. A. S. Eddington in *Scientia* for January. Prof. Eddington considers that there is now overwhelming evidence in favour of the existence